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A.D. 1887, 1st JULY. N° 9363.

PROVISIONAL SPECIFICATION.

The Manufacture of Wine from Barley and other Grain.

I, GEORGE EUGÈNE JACQUEMIN, of Nancy, France, Chemical Assistant in the Ecole Supérieure de Pharmacie do hereby declare the nature of this Invention to be as follows :—

This invention relates to the manufacture of wine from barley or other grain.

- 5 Natural wine is the result of the fermentation of a special must produced by expressing grapes, a special ferment being used *viz.* the elliptical mycoderme or ferment or wine yeast. But by providing a medium analogous to grape must the elliptical ferment or wine yeast will live and develop therein and produce a similar result that is to say, a beverage closely resembling wine made from grapes, quite as wholesome and containing no more alcohol of an injurious nature but possessing the important advantage of cheapness and thus being within the reach of the working classes, this beverage being at the same time one which would also be appreciated by other classes of persons.

- 15 For the purpose of my invention I make use of a must prepared from barley or other grain.

- Grape must contains various constituents and amongst others saccharine nitrogenous substances and minerals which serve as food for the ferment. Moreover it is of an acid nature which doubtless is of some advantage. I therefore prepare according to the present invention a similar medium with must obtained from germinated barley or malt sweetened by diastase in a manner well known to brewers. This must also contains saccharine nitrogenous and saline matters. I add to it a suitable quantity of bitartrate of potash for the production of an acidity similar to that of the juice of the grape and I introduce the elliptical ferment or wine yeast. The fermentation develops and follows the usual course. By employing the proportions of malt which are used in breweries for the manufacture of strong beer I obtain a vinous beverage containing from five to six per cent. of alcohol rich in nitrogenous and mineral substances and in matters containing dextrine and of a quality in extract of from sixty five to seventy per thousand which beverage is very nourishing and particularly suitable for feeding infants by reason of the large proportion of phosphates contained therein. But this product made as so far described is not to be compared with real wine.

[Price 6d.]

Jacquemin's Manufacture of Wine from Barley and other Grain.

In order to obtain from barley a wine comparable with wine made from grapes I diminish the proportion of malt so as to decrease the weight of the extract to between twenty six and thirty per thousand. I diminish the weight of the bitartrate of potash and I add a solution of cane sugar and tartaric acid in order to obtain inversion. The quantity of sugar added is such that the alcoholic degree after fermentation rises to about ten per cent. This sweetened barley must which is as rich in saccharine matter as good grape must produces wine of the same odour and taste as good ordinary white wine made from grapes. I have found from experience that good results are obtained by substituting for a portion of the germinated barley an equivalent proportion of cereal flour, rice or maize, and by using instead of cane sugar, the juice of saccharine plants beet-root sorgho and the like or even dextrose or glucose. Also by using instead of tartaric acid, citric acid which produces a wine which is relatively finer. Also by using instead of the elliptical ferment or wine yeast, beer or other yeast which however is not advisable because a beverage so obtained will contain injurious alcohol.

The wine obtained from barley by means of my invention is white with a light or dark yellow tinge more or less accentuated according to the degree of drying to which the malt has been subjected. It cannot be confounded with white wine made from grapes for the reason that it contains no tannin and that it can be precipitated by a solution of this substance. This characteristic can however be removed by adding a suitable quantity of tannin followed by filtration.

To obtain red wine it is necessary to use the juice of black cherries as a substitute for the sugar or to add to the must a colouring vegetable juice which is not injurious.

The white wine made according to my invention may be caused to be effervescent or like champagne and it furnishes by distillation spirit of a fine character also brandy of excellent quality.

I may employ in connection with this wine all modes of treatment or preservation employed with respect to grape wines such for example as warming or filtration or all other means suitable for preventing access of the germs in the air to the fermentations.

Dated this 1st day of July 1887.

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Jacquemin's Manufacture of Wine from Barley and other Grain.

COMPLETE SPECIFICATION.

The Manufacture of Wine from Barley and other Grain.

I, GEORGE EUGÈNE JACQUEMIN, of Nancy, France, Chemical Assistant in the Ecole Supérieure de Pharmacie, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement :—

5 This invention relates to the manufacture of wine from barley or other grain.

Natural wine is the result of the fermentation of a special must produced by expressing grapes a special ferment being used, *viz.* ;—the *saccharomyces* or elliptical ferment or wine yeast. But by providing a medium analogous to grape must, the elliptical ferment or wine yeast will live and develop therein and produce a similar
10 result, that is to say, a beverage closely resembling wine made from grapes, quite as wholesome and containing no more alcohol of an injurious nature but possessing the important advantage of cheapness and thus being within the reach of the working classes ; this beverage being at the same time one which would also be appreciated by other classes of persons.

15 Grape must contains various constituents and amongst others saccharine azotized and mineral substances which serve as food for the ferment. Moreover it is of an acid nature which doubtless is of some advantage. I therefore prepare according to the present invention a similar medium with must obtained from germinated barley or malt, saccharified by diastase in a manner well known to brewers. The said must
20 differs from beer wort which contains hops. It also contains saccharine azotized and saline substances. I add to it a suitable quantity of bitartrate of potash (cream of tartar) for the production of an acidity similar to that of the grape, thereby obviating the introduction of lactic ferment which brewers have great difficulty in preserving, and then introduce the elliptical ferment or wine yeast. The fermentation develops
25 and follows the usual course. By employing the proportions of malt which are used in breweries for the manufacture of strong beer, I obtain a vinous beverage containing from five to six per cent. of alcohol rich in dextrinous, azotized and mineral substances of a quality in extract of from sixty five to seventy per thousand, which beverage is very nourishing and particularly suitable for feeding infants by reason of the large
30 proportion of phosphates contained therein. This product made as so far described is not to be compared with real wine on account of the small quantity of alcohol it contains, but it answers several useful purposes.

In order to obtain from barley a wine comparable with wine made from grapes I diminish the proportion of malt so as to decrease the weight of the extract to between

Jacquemin's Manufacture of Wine from Barley and other Grain.

twenty six and thirty per thousand. I diminish the weight of the bitartrate of potash and I add a solution of cane sugar which I boil with tartaric acid in order to obtain inversion. Without this previous boiling with tartaric acid the fermentation would generally be too slow for obtaining good results. The said inversion of the sugar by an organic acid is essential. The quantity of inverted sugar added is such that the alcoholic degree after fermentation rises to about 10 per cent. This saccharified barley must, which is as rich in saccharine matter as good grape must, produces wine of the same odour and taste as good ordinary white wine made from grapes. I have found from experience that good results are obtained by substituting for a portion of the germinated barley the same proportion of cereal flour rice or maize, and by using instead of cane sugar, the juice of sacchariferous plants, beet-root, sorgho and the like previously concentrated or even dextrose or glucose or amylum and fecula that are saccharified by the diastase of the malt. Also by using, instead of tartaric acid, citric acid which produces a wine which is relatively finer. Also by using, instead of the elliptical ferment or wine yeast, beer or other yeast which however is not advisable because a beverage so obtained will contain injurious alcohol. This is not the case with wine yeast which produces, as in natural wine, besides vinous alcohol uninjurious normal superior alcohol, for example, normal butyl alcohol instead of isobutyl alcohol.

The wine obtained from barley is white with a light or dark yellow tinge more or less accentuated according to the degree of drying to which the malt has been subjected.

To obtain red wine it is necessary to use the juice of black cherries as a substitute for the sugar or part of the sugar, or to add to the must an uninjurious colouring vegetable juice or to cause the same to ferment upon cakes of red grape.

It is understood that the substances which I have mentioned as being used in the manufacture of the barley wine can be replaced by other substances possessing similar properties. For example the bitartrate of potash can be replaced by any other similar salt, such as bisaccharate of potash or the like.

I also employ, in the composition of the barley wine, tannin or any vegetable substances which contain the same, as well as any other bodies that are susceptible of precipitating albuminoid.

Cereal wine obtained in accordance with my invention can be treated or preserved in a similar manner as grape wine, for example it can be heated, filtered, or subjected to any operation adapted to prevent the fermentation taking place in contact with air containing germs.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed I wish it understood that I claim;—

First. The manufacture of barley wine, substantially as hereinbefore described.

Second. In the manufacture of barley wine the employment, for the purposes above specified, of germinated or ungerminated barley, or other cereal or vegetable substances of a similar nature containing an amylaceous principle, alone or conjointly with any fermentable saccharine substance obtained by industrial means or furnished by vegetable juices.

Third. The employment for the purposes above specified, of bitartrate of potash or a similar salt such as bisaccharate of potash alone or conjointly with tartaric acid, citric acid or other organic acid.

Fourth. The employment for the purposes above specified of an elliptic ferment or wine yeast, and of beer yeast or other ferment causing alcoholic fermentation and capable of producing barley wine, such as *saccharomyces*, *apiculatus*, *pastorianus*, or the like.

Fifth. The employment, for the purposes above specified, of tannin or other astringent substances known under the generic name of tannins, pure or in the natural state, that is to say, the employment of plants or parts of plants containing

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these substances, and also the employment of any products precipitating albnmenoid substances.

5 Sixth. The application of known means for protecting barley wine from germs contained in the air, or germs of diseases, and the heating or filtration which annihilate them or arrest them after fermentation.

Seventh. The new industrial products obtained by my process, such as white barley wine, and red barley wine and aerated or sparkling barley wine and also the products which can be obtained therefrom by distillation.

Dated this 1st March 1888.

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